Instruction and Assembly Manual

Channel Master®

.90m, 1.0m & 1.2m SMC ANTENNA SYSTEM WITH AZ/EL CAP MOUNT & KU-SINGLE POLARITY FEED

MODEL 6992 - .90m ANTENNA SYSTEM
MODEL 6978 - 1.0m ANTENNA SYSTEM
MODEL 6996 - 1.0m ANTENNA SYSTEM
MODEL 6997 - 1.2m ANTENNA SYSTEM
MODEL 6031 - .90m, 1.0m & 1.2m AZ/EL CAP

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Channel Master®

VSAT ANTENNA/MOUNT/FEED/LNB
LIMITED TWELVE (12) MONTH WARRANTY

This CHANNEL MASTER• equipment is warranted to be free from defects in material and workmanship under normal use and service. CHANNEL MASTER shall repair or replace defective equipment, at no charge, or at its option, refund the purchase price, if the equipment is returned to CHANNEL MASTER not more than twelve (12) months after shipment. Removal or replacement of equipment and its transportation shall not be at the cost of CHANNEL MASTER except CHANNEL MASTER shall return repaired or replaced equipment freight prepaid.

This Warranty shall not apply to equipment which has been repaired or altered in any way so as to affect its stability or durability, nor which has been subject to misuse, negligence or accident. This Warranty does not cover equipment which has been impaired by severe weather conditions such as excessive wind, ice, storms, lightning, or other natural occurrences over which CHANNEL MASTER has no control, Nor shall this Warranty apply to equipment which has been operated or installed other than in accordance with the instructions furnished by CHANNEL MASTER.

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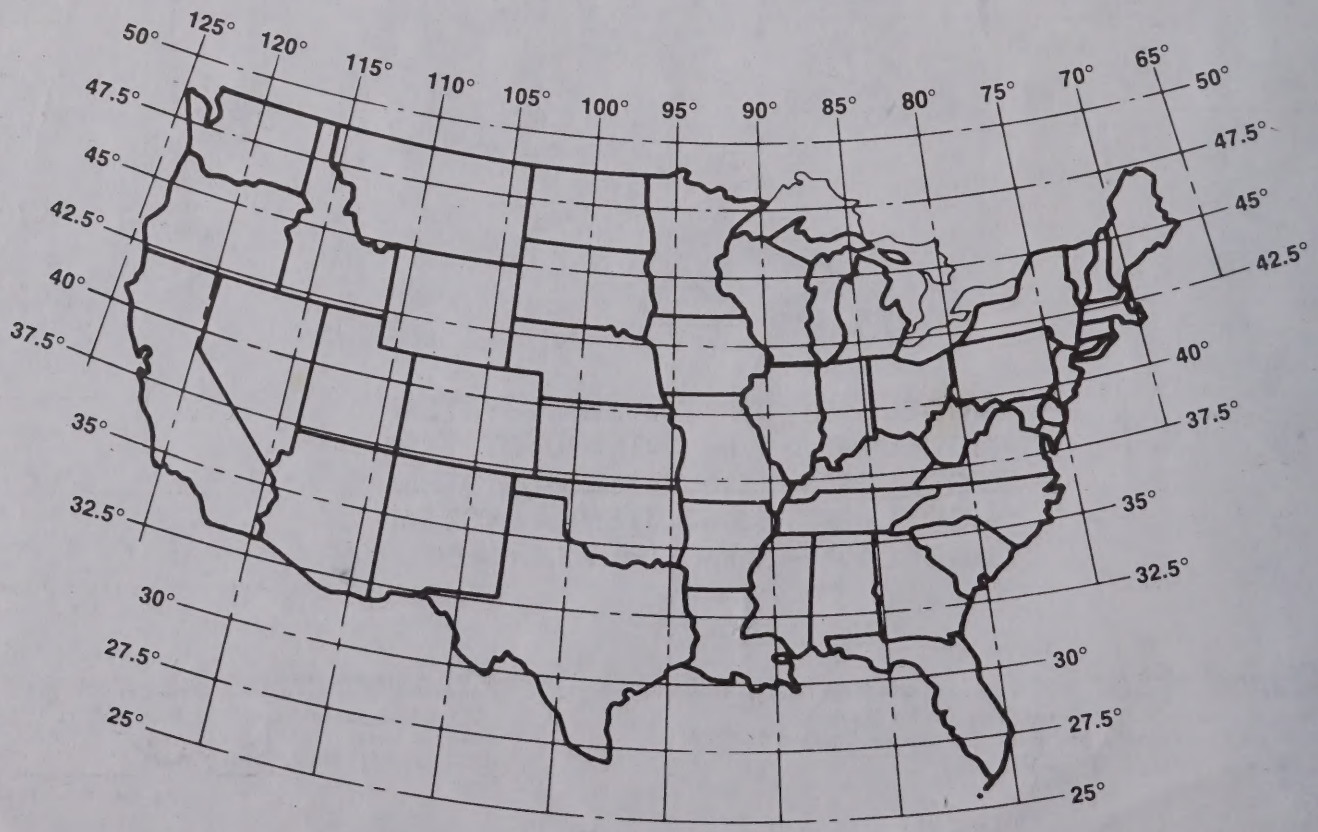

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2/26/90	Changed Pages 4, 6, 7, 8, 9 and 10. ECN 9001516	A
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9/93	Changed Cover, Inside Front Cover, Pages 1, 4, 6, 7, 8, 9, 10 & 11. ECN 9002250	F
10/94	Changed Cover and Page 1. ECN 9002568	G

DANGER!!!

WATCH FOR WIRES! Installation of this product near power lines is dangerous. For your own safety, follow these important safety rules.

1. Perform as many assembly functions as possible on the ground.
2. Watch out for overhead power lines. Check the distance to the power lines before starting installation. We recommend you stay a minimum of 6 meters (20 feet) from all power lines.
3. Do not use metal ladders.
4. Do not install antenna or mast assembly on a windy day.
5. If you start to drop antenna or mast assembly, get away from it and let it fall.
6. If any part of the antenna or mast assembly comes in contact with a power line, call your local power company. DO NOT TRY TO REMOVE IT YOURSELF! They will remove it safely.
7. Make sure that the mast assembly is properly grounded.

WARNING!!!

Assembling dish antennas on windy days can be dangerous. Because of the antenna surface, even slight winds create strong forces. For example, a 1 meter antenna facing a wind of 48 km/h (30 mph) can undergo forces of 269 N-m (60 lbs.). Be prepared to safely handle these forces at unexpected moments.

Do not attempt to assemble, move, or mount a dish on windy days or serious, even fatal accidents may occur. Channel Master® is not responsible or liable for damage or injury resulting from antenna installations.

INTRODUCTION

This manual covers the installation of the Channel Master 1.0m & 1.2m SMC antenna system with AZ/EL cap mount and Ku single polarity feed.

For best results in the assembly process, perform each step in the same sequence as listed in this manual.

SPECIFICATIONS

	.90m	1.0m	1.2m
Diameter	35.43"	39.37"	47.25"
F/D Ratio	.6	.6	.6
Focal Length	21.26"	23.62"	28.35"

SITE SELECTION

The first and most important consideration when choosing a prospective antenna site is whether or not the area can provide an acceptable "look angle" at the Satellite. A site with a clear, unobstructed view facing south, southeast or southwest is required. Your antenna site must be selected in advance so that you will be able to receive the strongest signal available. To avoid obstructions, it is important to conduct an on-site survey with a portable antenna.

As with any type of construction, a local permit may be required before installing an antenna. It is the owner's responsibility to obtain any and all permits.

FOUNDATION
SUGGESTED SLAB FOUNDATION

Although more expensive in materials, the slab foundation is used to support many satellite earth stations. The dimensions of the slab depend on a number of factors including soil, frost conditions, and local winds. It is strongly recommended that the services of a civil or other consulting engineer be used to determine the necessary dimensions.

Soil sould be excavated from an area equal to the required size of the slab. All loose soil must be removed and the hole should be tamped. Sides of hole should be straight to prevent frost heaving.

A concrete form can be used, but this may be avoided if the excavation dimensions are the same as the desired foundation size.

NOTE:

1 - Be certain that the slab depth exceeds the frost line according to conditions.

2 - All internal steel parts including rebar and base tube should be 102mm (4") from any outside concrete surface.

The design shown here does not represent an appropriate foundation for any specific locality or antenna installation. It is provided for reference purposes only.

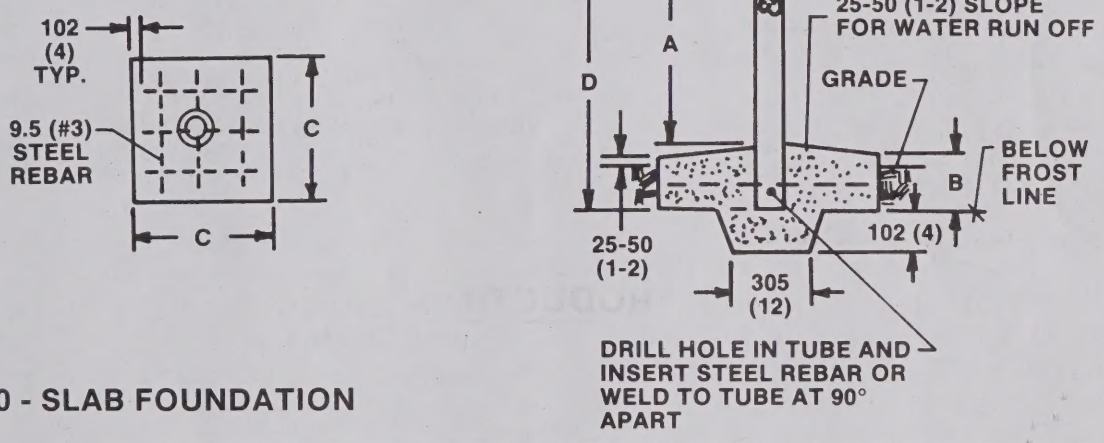


FIG. 1.0 - SLAB FOUNDATION

*IF DEPTH OF FOUNDATION MUST BE INCREASED TO BE BELOW FROST LINE, LENGTH OF TUBE MUST BE INCREASED ACCORDINGLY.

NOTE: IF MODEL 6048 GROUND TUBE IS USED, CUT OFF 533mm (21") OF LENGTH ON END OPPOSITE HOLES FOR REBAR.

- USA (INCHES) -

ANT. SIZE	WIND VELOCITY	CONCRETE DIM.			CONC. VOL.	TUBE SIZE	*TUBE LG.	TUBE Fy
		"A"	"B"	"C"	YDS.^{3}	O.D. x WALL THICKNESS	"D"	PSI
.90m & 1.0m	90 mph	43	12	30	.25	3.0 x 16 GA.	57	40000
	120 mph	43	12	30	.35	3.0 x 10 GA.	57	40000
1.2m	90 mph	43	12	36	.34	3.0 x 10 GA.	57	40000
	120 mph	43	12	45	.60	3.0 x 10 GA. or 3.0 x 7 GA.	57	40000

- METRIC (mm) -

ANT. SIZE	WIND VELOCITY	CONCRETE DIM.			CONC. VOL.	TUBE SIZE	*TUBE LG.	TUBE Fy
		"A"	"B"	"C"	M^3	O.D. x WALL THICKNESS	"D"	MPa
.90m & 1.0m	145 km/h	1002	305	762	.19	76 x 1.6	1448	276
	193 km/h	1002	305	762	.27	76 x 3.2	1448	276
1.2m	145 km/h	1002	305	914	.26	76 x 3.2	1448	276
	193 km/h	1002	305	1143	.46	76 x 4.6	1448	276

SUGGESTED PIER FOUNDATION

Design based on allowable vertical soil bearing pressure of 96 K Pa (2000 psf) and lateral pressure of 19 K Pa (400 psf). Soil conditions vary and you should consult with a local professional engineer for modifications, if any, to suit local soil conditions and code requirements.

Designs shown here do not represent an appropriate foundation for any specific locality or antenna installation. They are provided for reference purposes only.

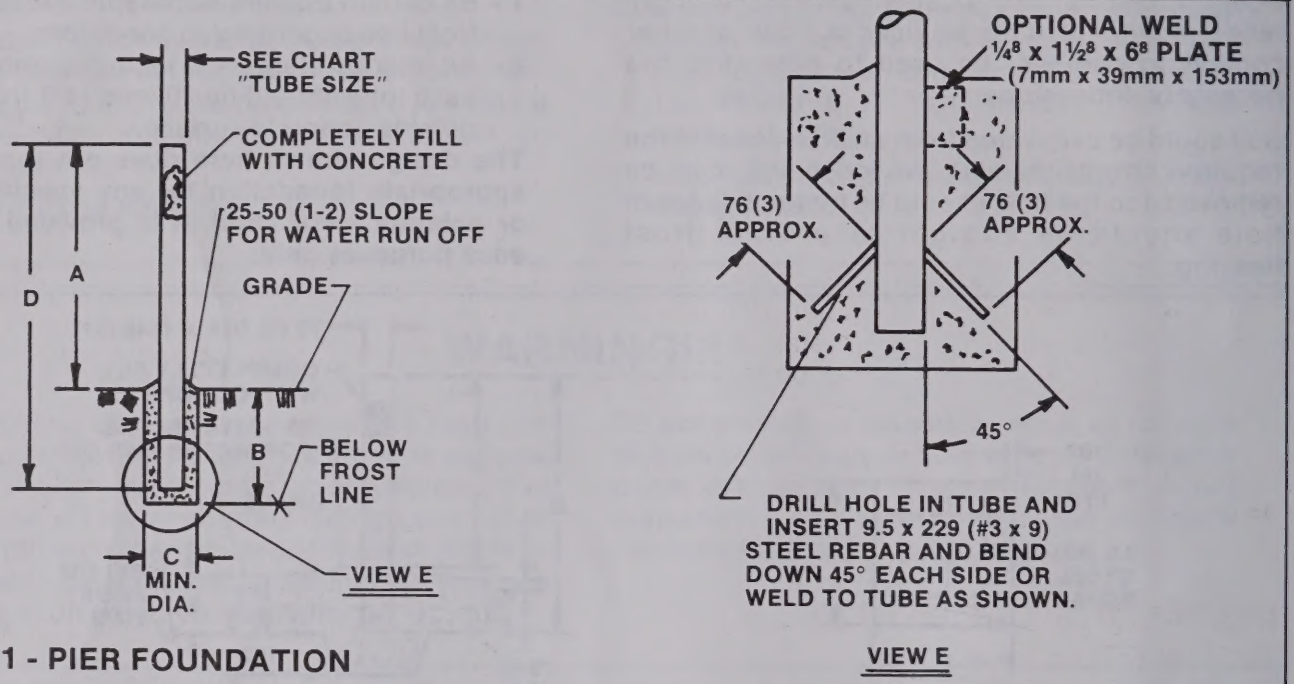

SEE CHART "TUBE SIZE"
COMPLETELY FILL WITH CONCRETE
25-50 (1-2) SLOPE FOR WATER RUN OFF
GRADE
D
A
B
BELOW FROST LINE
C MIN. DIA.
VIEW E
OPTIONAL WELD
¼⁸ x 1½⁸ x 6⁸ PLATE
(7mm x 39mm x 153mm)
76 (3) APPROX.
76 (3) APPROX.
45°
DRILL HOLE IN TUBE AND INSERT 9.5 x 229 (#3 x 9) STEEL REBAR AND BEND DOWN 45° EACH SIDE OR WELD TO TUBE AS SHOWN.
VIEW E

FIG. 1.1 - PIER FOUNDATION

*IF DEPTH OF FOUNDATION MUST BE INCREASED TO BE BELOW FROST LINE, LENGTH OF TUBE MUST BE INCREASED ACCORDINGLY.

NOTE: YIELD STRESS SHOWN ON CHART (Fy) ON PRECEDING PAGE.

- USA (INCHES) -

ANT. SIZE	WIND VELOCITY	CONCRETE DIM.			CONC VOL	TUBE SIZE	*TUBE LENGTH
		"A"	"B"	"C"	YDS.^{3}	O.D. x WALL THICKNESS	"D"
.90m & 1.0m	90 mph	39	37	10	.06	3.0 x 16 GA.	74
	125 mph	39	39	16	.20	3.0 x 10 GA.	74
1.2m	90 mph	39	39	14	.14	3.0 x 10 GA.	74
	125 mph	39	39	20	.28	3.0 x 7 GA.	74

- METRIC (mm) -

ANT. SIZE	WIND VELOCITY	CONCRETE DIM.			CONC VOL	TUBE SIZE	*TUBE LENGTH
		"A"	"B"	"C"	M^3	O.D. x WALL THICKNESS	"D"
.90m & 1.0m	145 km/h	991	940	254	.05	76 x 1.6	1880
	201 km/h	991	991	407	.16	76 x 3.2	1880
1.2m	145 km/h	991	991	356	.10	76 x 3.2	1880
	201 km/h	991	991	508	.22	76 x 4.6	1880

ASSEMBLY AND INSTALLATION

The AZ/EL Cap Mount can be installed on a 3" O.D. ground tube, roof, or wall mount. The mount should be assembled and in place before installing the cap mount.

As the AZ/EL cap mount is factory preassembled, there is no assembly required for the mount.

ASSEMBLING ANTENNA TO CAP MOUNT

Install four M8 x 60mm (2⅜") carriage bolts (22A) into holes in center of antenna and cap mount flanges. (Reference Fig. 2.0) Install four lock washers (23) and hex nuts (24) on bolts. Tighten and torque to 11 ft.-lbs (15 N-m).

IMPORTANT! Bottom feed leg hole to be located as shown in Fig. 2.0.

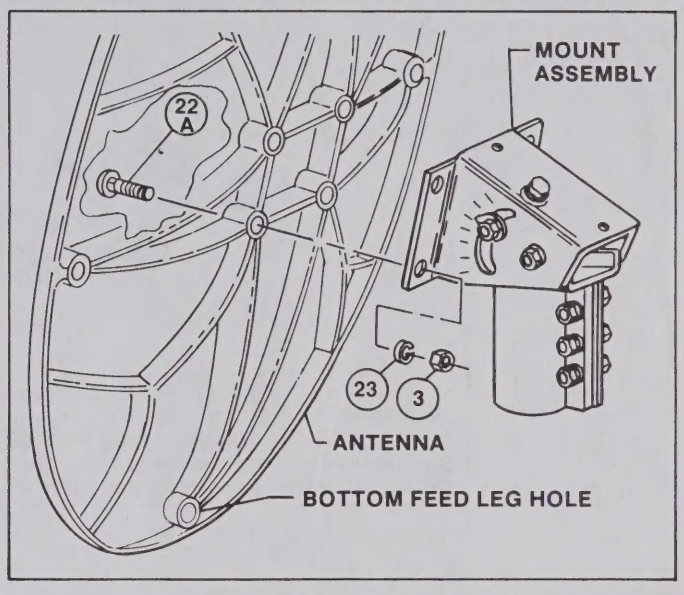


FIG. 2.0—ASSEMBLING ANTENNA TO AZ/EL CAP MOUNT

INSTALLING CAP MOUNT ON MOUNT TUBE

Lift antenna/cap mount assembly and slide cap mount onto mount tube (Reference Fig. 2.1). Swivel antenna/mount assembly until antenna faces southward.

Tighten M8 clamp nuts so that the antenna/cap mount assembly is held stationary on 76mm (3.00") tube, but can be swiveled with slight pressure.

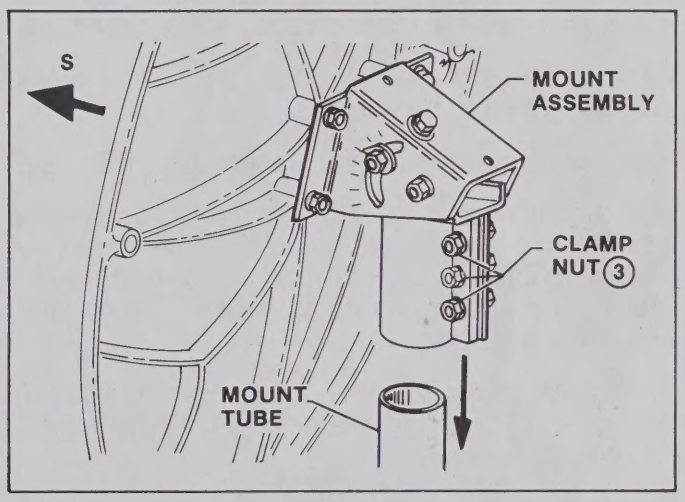


FIG. 2.1—INSTALLING ANTENNA/MOUNT ASSEMBLY ONTO MOUNT TUBE

FEED, FEED LEGS AND LNB INSTALLATION

Assemble feed assembly and feed legs to antenna as shown in Fig. 2.2.

Insert bottom feed leg (20) into hole in bottom edge of antenna (17). NOTE: Bottom feed leg is the one with a slight bend on one end of leg, lance on opposite end, and is shorter than the two side legs (16).

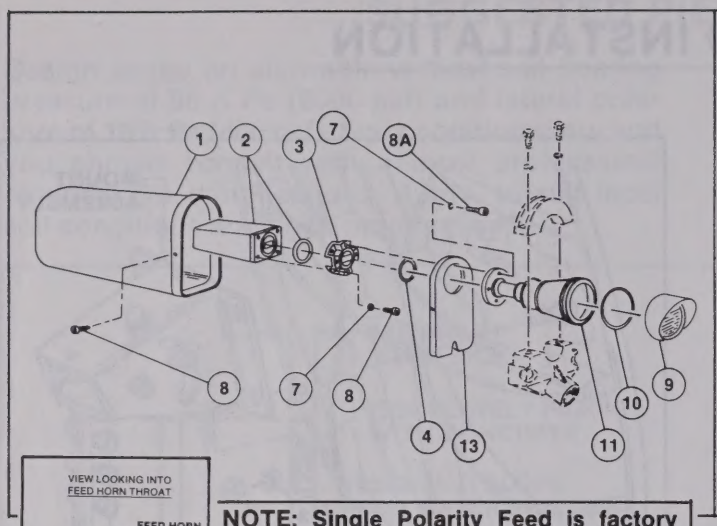
Install side legs (16) to antenna, from back side of antenna, and secure with M6 x 30mm (1/4" x 1-3/16") hex bolts and 1/4" flat washer (6 & 5). Do not tighten.

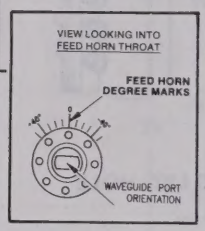
Insert one side leg (16) into junction block (12) and secure with M6 x 30mm (1/4" x 1-3/16") hex bolts and 1/4" flat washer (6 & 5). Do not tighten.

Insert bottom leg (20) into hole on center of junction block (12) until lance on leg is engaged.

Insert opposite side leg (16) into junction block (12) and secure with M6 x 30mm hex bolt and 1/4" flat washer (6 & 5). **Tighten and torque bolts securing side legs to junction block and antenna to 4 ft-lbs (5.4 N-m).**

Assemble horn, junction block (12) and clamp using two M6 x 20mm bolts and M6 flat washers (22 & 18) as illustrated in Figs. 2.2 and 3.0.





NOTE: Single Polarity Feed is factory assembled for vertical polarity. If horizontal polarity is desired, rotate feed 90° (clockwise or counterclockwise) from values shown in charts on pages 8 thru 11.

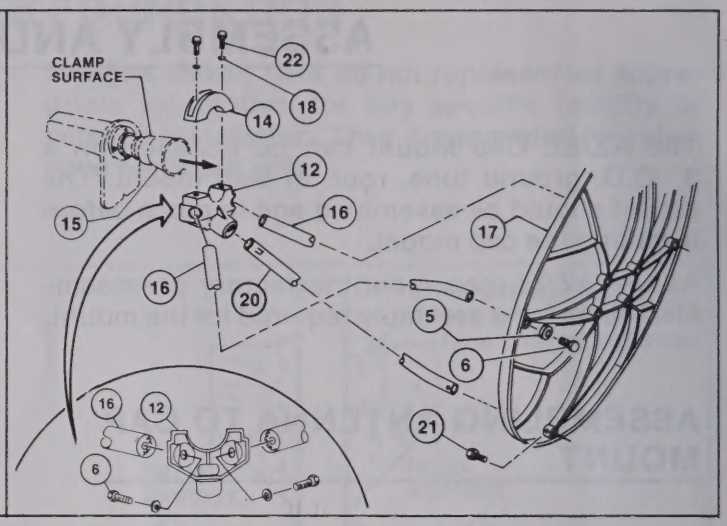


FIG. 2.2 - INSTALLATION OF FEED AND FEED SUPPORT LEGS TO ANTENNA

Feed models with LNB's are factory assembled as shown in Figure 1.6. For models not supplied with LNB's refer to instructions packed with feed.

Assemble feed assembly (15) to junction block (12) as shown in illustration.

Remove cover (1) from feed assembly (15).

Use bottom feed leg (20) as conduit and route coaxial cable up through leg. Leave approximately 305mm (12") length beyond junction block. Install "F" connector onto cable and assemble to LNB.

Make sure feed cable is in the groove on bottom of header (13) and install cover (1). Secure with two M4 screws (8).

Be sure bottom feed leg (20) is seated and tighten hex screw (21) on boss, rear of antenna, securing leg to antenna.

IMPORTANT: Sealing RF coaxial connector:
The copper-plated center conductor in the RF coaxial cable, which connects receiver to LNB, can experience electrolysis corrosion at the LNB connector. Moisture and DC current cause this type of corrosion. To prevent corrosion, apply a moderate coat of silicon grease to the center conductor and then wrap the entire connection with **COAX-SEAL®** tape to seal.

(COAX-SEAL® IS A REGISTERED TRADEMARK OF UNIVERSAL ELECTRONICS, INC.)

GROUNDING

ALL INSTALLATIONS TO CONFORM TO THE LATEST ISSUE OF THE NATIONAL ELECTRIC CODE.

Ground pole, antenna mount assembly and feed cables must be grounded in accordance with current National Electric Code and local electric codes to protect from surges due to nearby lightning strikes. The illustration below illustrates a typical grounding method.

Clamps that provide a solid connection between ground wire and ground source should be used.

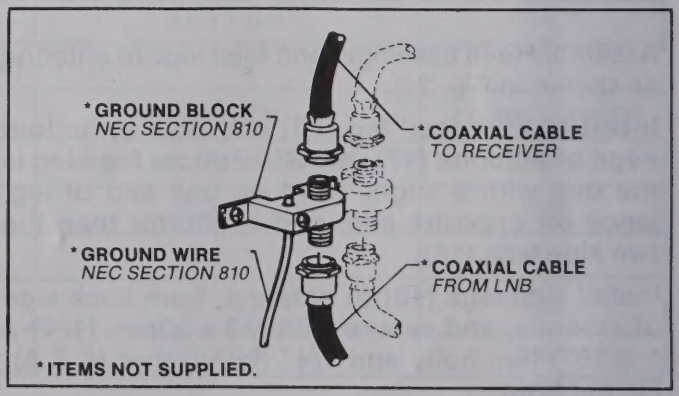


FIG. 2.3 - GROUNDING FEED CABLES

ANTENNA ALIGNMENT PROCEDURE

The three adjustments necessary to align the antenna are:

(1) Polarization of the feed (Reference Fig. 3.0).
(2) Elevation (Ref. Fig. 3.1).
(3) Azimuth (Ref. Fig. 3.2). See Charts, Pages 8, 9, 10 & 11 for appropriate values.

NOTE: See front of manual for long./lat. map.

POLARIZATION OF THE FEED

Polarization of feed is obtained by loosening the two M6 clamp bolts (22) and turning the feed. Align alignment mark on clamp with "0" (zero) mark on horn scale (Ref. Fig. 3.0). Make sure clamp is installed with arrow pointed toward antenna as shown in Fig. 3.0. The polarization setting for each satellite is shown on Charts, Pages 8-11. Keep cable groove on header in the down position when adjusting polarization. **NOTE: Single Polarity Feed is factory assembled for vertical polarity. If horizontal polarity is desired, rotate feed 90° (clockwise or counter-clockwise) from values shown in charts on pages 8 thru 11.**

ELEVATION

To obtain elevation value for your satellite, refer to charts on pages 8-11. Loosen bolts in curved slots of AZ/EL Housing 1/8 to 1/4 a turn (Ref. Fig. 3.1). Turn elevation adjustment bolt clockwise to decrease elevation and counterclockwise to increase elevation. Align the pointer with appropriate mark at the desired elevation reading (Ref. Fig. 3.1). This will be an approximate setting. Optimum setting achieved when fine tuning. Temporarily tighten elevation bracket nuts.

AZIMUTH

Obtain azimuth for your satellite from charts on Pages 8-11. Rotate the antenna and mount, pointing it to the correct compass reading for your location and satellite (Ref. Fig. 3.2). Slowly sweep the antenna in azimuth until a signal is found. If the desired signal is not found, increase or decrease elevation setting and repeat the azimuth sweep.

FINE TUNING

Use a signal strength measuring device for final adjustments to obtain maximum antenna performance. Alternate between elevation and azimuth fine tuning to reach maximum signal strength until no improvement can be detected.

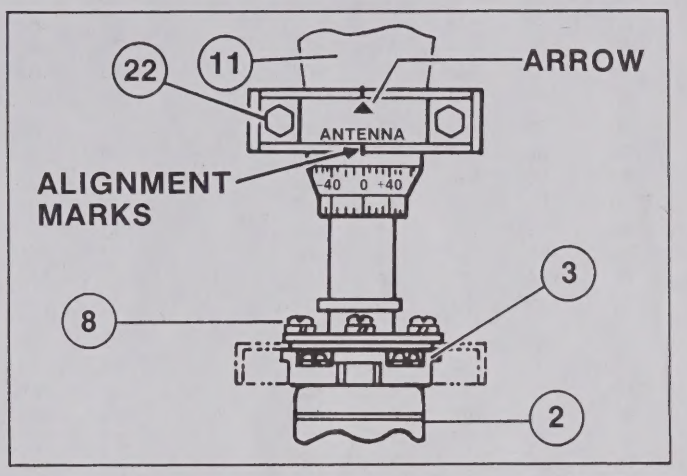


FIG. 3.0—POLARIZATION OF THE FEED

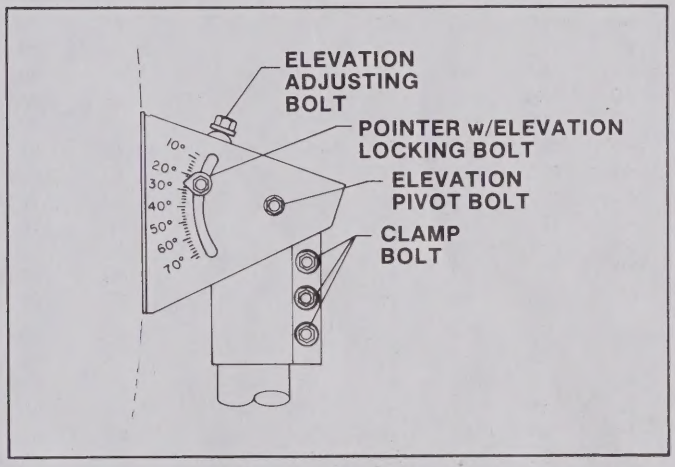


FIG. 3.1—SETTING ANTENNA ELEVATION

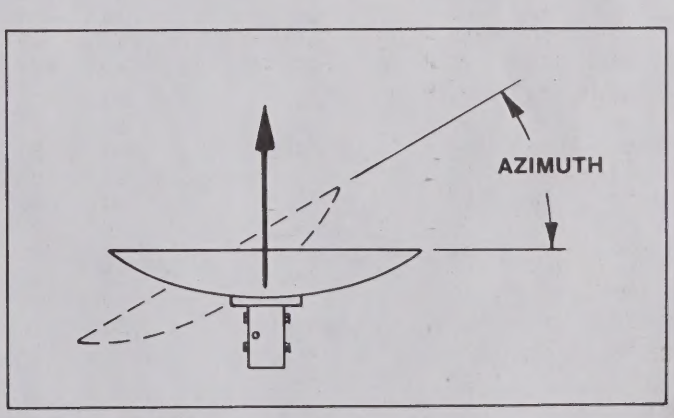


FIG. 3.2 — ROTATING ANTENNA FOR AZIMUTH

Tighten all hardware. Torque for M8 round head, square neck bolts is 15 N-m (11 ft-lbs).

US ANTENNA ALIGNMENT CHARTS

S2 SATELLITE 69° W					K2 SATELLITE 81° W					K1 SATELLITE 85° W				
LAT.	LONG.	AZ	EL	POL.	LAT.	LONG.	AZ	EL	POL.	LAT.	LONG.	AZ	EL	POL.
25	80	155	58	-22	25	80	182	61	+ 9	25	80	192	60	+18
25	85	144	56	-31	25	85	169	60	- 2	25	85	178	61	+ 7
25	90	133	53	-38	25	90	155	59	-12	25	90	163	60	- 4
25	95	123	49	-43	25	95	142	57	-20	25	95	149	59	-13
25	100	115	45	-48	25	100	131	54	-28	25	100	138	56	-22
30	80	159	53	-18	30	80	182	55	+ 9	30	80	190	55	+16
30	85	148	51	-26	30	85	170	55	0	30	85	178	55	+ 7
30	90	138	48	-32	30	90	157	54	- 8	30	90	165	55	0
30	95	128	45	-37	30	95	146	52	-16	30	95	153	53	-10
30	100	120	41	-42	30	100	135	49	-22	30	100	142	51	-17
30	105	114	38	-46	30	105	127	46	-28	30	105	133	49	-24
30	110	107	34	-49	30	110	119	43	-33	30	110	124	46	-29
30	115	101	29	-51	30	115	112	39	-37	30	115	116	42	-34
35	75	176	50	- 9	35	75	196	49	+15	35	75	203	48	+21
35	80	165	48	-15	35	80	186	49	+ 8	35	80	193	49	+14
35	85	153	46	-22	35	85	173	49	+ 1	35	85	180	49	+ 7
35	90	142	44	-27	35	90	160	48	- 6	35	90	167	49	0
35	95	134	41	-32	35	95	153	47	-12	35	95	157	48	- 7
35	100	124	38	-36	35	100	139	45	-18	35	100	145	46	-13
35	105	116	34	-40	35	105	130	42	-23	35	105	136	44	-19
35	110	108	31	-43	35	110	121	39	-28	35	110	126	41	-24
35	115	102	27	-46	35	115	113	36	-32	35	115	118	38	-29
35	120	97	23	-48	35	120	107	32	-35	35	120	111	35	-32
40	70	188	44	- 2	40	70	209	42	+20	40	70	213	41	+24
40	75	179	43	- 7	40	75	197	43	+14	40	75	203	43	+19
40	80	169	42	-13	40	80	188	44	+ 8	40	80	194	44	+13
40	85	158	41	-18	40	85	176	44	+ 2	40	85	182	44	+ 7
40	90	146	39	-23	40	90	163	43	- 4	40	90	169	44	+ 1
40	95	135	37	-28	40	95	151	42	- 9	40	95	155	43	- 4
40	100	127	34	-32	40	100	142	40	-14	40	100	147	41	-10
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40	120	99	21	-43	40	120	109	29	-30	40	120	114	32	-27
40	125	93	17	-45	40	125	104	26	-33	40	125	108	28	-31
45	70	199	38	- 1	45	70	215	37	+18	45	70	221	36	+22
45	75	184	38	- 6	45	75	201	38	+13	45	75	206	37	+17
45	80	173	37	-11	45	80	189	38	+ 8	45	80	195	38	+12
45	85	162	36	-17	45	85	178	38	+ 3	45	85	184	38	+ 7
45	90	149	34	-20	45	90	164	37	- 2	45	90	170	38	+ 2
45	95	138	32	-24	45	95	154	36	- 7	45	95	159	37	- 3
45	100	129	30	-27	45	100	143	35	-11	45	100	148	36	- 8
45	105	118	27	-31	45	105	132	33	-15	45	105	137	35	-12
45	110	111	24	-33	45	110	124	31	-19	45	110	129	33	-16
45	115	105	21	-36	45	115	117	28	-22	45	115	122	30	-20
45	120	100	18	-38	45	120	111	26	-25	45	120	115	28	-23
45	125	96	15	-40	45	125	106	23	-28	45	125	110	25	-26
50	70	199	33	- 1	50	70	214	32	+16	50	70	219	31	+19
50	75	190	32	- 5	50	75	207	32	+12	50	75	211	32	+15
50	80	178	32	- 9	50	80	193	33	+ 8	50	80	199	33	+11
50	85	164	31	-13	50	85	179	33	+ 3	50	85	184	33	+ 7
50	90	151	29	-17	50	90	166	32	- 1	50	90	172	32	+ 3
50	95	142	28	-20	50	95	156	31	- 5	50	95	161	32	- 1
50	100	130	26	-24	50	100	144	30	- 8	50	100	149	31	- 4
50	105	119	23	-26	50	105	132	28	-12	50	105	137	30	- 9
50	110	112	21	-29	50	110	125	26	-15	50	110	130	28	-13
50	115	107	18	-31	50	115	119	24	-18	50	115	123	26	-16
50	120	101	16	-33	50	120	112	22	-21	50	120	117	24	-19
50	125	96	13	-35	50	125	107	19	-23	50	125	111	21	-21

Legend - LAT = Latitude Degrees North
LONG = Longitude Degrees West
AZ = Azimuth Heading, Direct Compass Reading (Magnetic Deviation is Included in Charts)
EL = Elevation in Degrees, Direct Reading
POL = Polarization of Feed Scale Setting in degrees for Vertical Polarity. If Horizontal Polarity is desired, rotate Feed 90° (clockwise or counterclockwise) from values shown on charts above.

US ANTENNA ALIGNMENT CHARTS

SBS-4 SATELLITE 91° W

LAT.	LONG.	AZ	EL	POL.
25	80	205	58	+22
25	85	192	60	+13
25	90	177	61	+ 2
25	95	163	60	- 9
25	100	150	59	-19
30	80	201	53	+18
30	85	190	54	+10
30	90	177	55	+ 2
30	95	164	55	- 7
30	100	152	54	-15
30	105	143	52	-23
30	110	132	49	-29
30	115	123	46	-35
35	75	213	46	+21
35	80	203	48	+15
35	85	190	50	+ 8
35	90	178	49	+ 1
35	95	167	49	- 6
35	100	155	48	-13
35	105	144	47	-19
35	110	134	45	-25
35	115	125	42	-30
35	120	118	39	-35
40	70	220	39	+23
40	75	212	41	+18
40	80	205	42	+13
40	85	191	43	+ 7
40	90	178	44	+ 1
40	95	166	44	- 5
40	100	156	43	-11
40	105	147	42	-16
40	110	135	40	-21
40	115	126	38	-26
40	120	120	35	-30
40	125	114	32	-34
45	70	229	34	+20
45	75	220	36	+15
45	80	203	37	+11
45	85	193	38	+ 6
45	90	178	38	+ 1
45	95	167	38	- 4
45	100	156	37	- 9
45	105	145	36	-14
45	110	136	35	-18
45	115	129	33	-22
45	120	122	31	-26
45	125	116	28	-29
50	70	227	29	+17
50	75	219	31	+13
50	80	206	32	+ 9
50	85	192	32	+ 5
50	90	179	33	+ 1
50	95	169	33	- 3
50	100	156	32	- 7
50	105	144	31	-11
50	110	137	30	-15
50	115	130	28	-19
50	120	123	26	-22
50	125	116	24	-25

SBS-3 SATELLITE 95° W

LAT.	LONG.	AZ	EL	POL.
25	80	212	56	+29
25	85	201	59	+20
25	90	287	60	+11
25	95	172	61	0
25	100	158	60	-11
30	80	208	51	+24
30	85	197	53	+17
30	90	185	55	+ 9
30	95	172	55	0
30	100	160	55	- 9
30	105	150	53	-17
30	110	149	51	-24
30	115	129	49	-31
35	75	218	44	+26
35	80	209	46	+20
35	85	197	48	+14
35	90	185	49	+ 7
35	95	174	49	0
35	100	161	49	- 7
35	105	151	48	-14
35	110	140	46	-20
35	115	131	44	-26
35	120	123	41	-31
40	70	226	37	+27
40	75	218	39	+22
40	80	209	41	+17
40	85	197	43	+12
40	90	185	44	+ 6
40	95	172	44	0
40	100	162	44	- 6
40	105	153	43	-12
40	110	140	41	-17
40	115	132	39	-22
40	120	125	37	-27
40	125	118	34	-31
45	70	233	33	+23
45	75	219	35	+19
45	80	209	36	+14
45	85	198	37	+10
45	90	184	38	+ 5
45	95	173	38	0
45	100	162	38	- 5
45	105	150	37	-10
45	110	141	36	-14
45	115	134	35	-19
45	120	127	33	-23
45	125	121	30	-26
50	70	231	28	+19
50	75	223	30	+16
50	80	211	31	+12
50	85	197	32	+ 8
50	90	185	33	+ 4
50	95	174	33	0
50	100	162	33	- 4
50	105	149	32	- 8
50	110	142	31	-12
50	115	135	30	-16
50	120	128	28	-19
50	125	122	26	-23

SBS-6 SATELLITE 99° W

LAT.	LONG.	AZ	EL	POL.
25	80	219	54	+35
25	85	209	57	+27
25	90	196	60	+19
25	95	181	60	+ 9
25	100	168	61	- 2
30	80	215	49	+29
30	85	205	52	+23
30	90	193	54	+15
30	95	188	55	+ 7
30	100	168	55	- 2
30	105	157	54	-10
30	110	146	53	-18
30	115	135	51	-25
35	75	224	42	+30
35	80	215	45	+25
35	85	204	47	+19
35	90	191	48	+13
35	95	181	49	+ 6
35	100	177	49	- 1
35	105	158	50	- 8
35	110	146	48	-15
35	115	136	46	-21
35	120	128	44	-27
40	70	231	35	+30
40	75	223	38	+26
40	80	214	40	+21
40	85	203	42	+16
40	90	191	43	+11
40	95	178	44	+ 5
40	100	168	44	- 1
40	105	159	43	- 7
40	110	146	42	-13
40	115	137	41	-18
40	120	130	40	-23
40	125	123	37	-27
45	70	238	31	+26
45	75	224	33	+22
45	80	214	35	+18
45	85	203	36	+14
45	90	190	37	+ 9
45	95	179	38	+ 4
45	100	168	38	- 1
45	105	156	38	- 6
45	110	147	37	-11
45	115	139	36	-15
45	120	132	34	-20
45	125	125	32	-23
50	70	236	26	+22
50	75	228	28	+19
50	80	226	30	+15
50	85	202	31	+11
50	90	190	32	+ 7
50	95	179	33	+ 3
50	100	157	33	- 1
50	105	154	32	- 5
50	110	147	32	- 9
50	115	140	31	-13
50	120	132	29	-17
50	125	127	28	-20

Legend - LAT = Latitude Degrees North
LONG = Longitude Degrees West
AZ = Azimuth Heading, Direct Compass Reading (Magnetic Deviation is Included in Charts)
EL = Elevation in Degrees, Direct Reading
POL = Polarization of Feed Scale Setting in degrees for Vertical Polarity. If Horizontal Polarity is desired, rotate Feed 90° (clockwise or counterclockwise) from values shown on charts above.

US ANTENNA ALIGNMENT CHARTS

GS1 SATELLITE 103° W

LAT.	LONG.	AZ	EL	POL.
25	80	225	51	+66
25	85	216	55	+59
25	90	204	57	+52
25	95	190	59	+43
25	100	177	61	+32
30	80	220	47	+60
30	85	211	50	+54
30	90	200	52	+47
30	95	188	54	+40
30	100	176	55	+31
30	105	165	55	+23
30	110	153	54	+14
30	115	142	53	+ 6
35	75	229	40	+60
35	80	221	43	+55
35	85	210	45	+50
35	90	198	47	+44
35	95	188	49	+37
35	100	175	49	+30
35	105	164	49	+23
35	110	153	49	+16
35	115	147	47	+10
35	120	134	46	+ 4
40	70	235	33	+59
40	75	228	36	+55
40	80	219	38	+51
40	85	209	40	+46
40	90	197	42	+41
40	95	184	43	+35
40	100	175	44	+30
40	105	160	44	+24
40	110	152	43	+18
40	115	143	42	+12
40	120	136	41	+ 7
40	125	128	39	+ 2
45	70	243	29	+55
45	75	229	31	+51
45	80	219	33	+47
45	85	209	35	+43
45	90	195	37	+39
45	95	159	38	+34
45	100	173	38	+29
45	105	161	38	+24
45	110	152	38	+19
45	115	144	37	+14
45	120	137	36	+10
45	125	130	34	+ 6
50	70	240	25	+51
50	75	233	27	+47
50	80	221	29	+44
50	85	207	30	+41
50	90	195	31	+37
50	95	184	32	+33
50	100	172	33	+29
50	105	159	33	+24
50	110	152	32	+20
50	115	145	32	+16
50	120	137	31	+12
50	125	131	29	+ 9

GS2 SATELLITE 105° W

LAT.	LONG.	AZ	EL	POL.
25	80	228	50	+42
25	85	219	53	+36
25	90	207	56	+29
25	95	195	59	+20
25	100	182	60	+11
30	80	223	46	+36
30	85	214	49	+31
30	90	203	51	+24
30	95	191	53	+17
30	100	180	55	+ 9
30	105	169	55	0
30	110	157	55	- 8
30	115	146	53	-17
35	75	231	38	+35
35	80	223	41	+31
35	85	212	44	+26
35	90	201	46	+20
35	95	187	48	+14
35	100	177	49	+ 7
35	105	165	49	0
35	110	156	49	- 7
35	115	146	48	-14
35	120	137	46	-20
40	70	237	32	+34
40	75	230	34	+31
40	80	222	37	+27
40	85	212	39	+22
40	90	200	41	+17
40	95	187	43	+12
40	100	179	43	+ 6
40	105	168	44	0
40	110	155	44	- 6
40	115	146	43	-11
40	120	138	41	-17
40	125	131	39	-22
45	70	245	28	+30
45	75	231	30	+27
45	80	221	33	+23
45	85	211	35	+19
45	90	198	36	+15
45	95	187	37	+10
45	100	176	38	+ 5
45	105	164	38	0
45	110	155	38	- 5
45	115	147	37	-10
45	120	139	36	-14
45	125	133	35	-19
50	70	242	24	+26
50	75	235	26	+23
50	80	223	28	+20
50	85	209	30	+16
50	90	197	31	+12
50	95	187	32	+ 8
50	100	175	33	+ 4
50	105	162	33	0
50	110	155	33	- 4
50	115	147	32	- 8
50	120	140	31	-12
50	125	134	30	-16

C2 (ANIK) SATELLITE 110° W

LAT.	LONG.	AZ	EL	POL.
25	80	234	46	+47
25	85	226	50	+42
25	90	216	53	+36
25	95	204	56	+29
25	100	193	59	+21
30	80	229	42	+41
30	85	221	46	+36
30	90	211	49	+31
30	95	200	51	+24
30	100	189	53	+17
30	105	179	54	+ 9
30	110	167	55	0
30	115	155	55	- 8
35	75	237	35	+39
35	80	229	38	+36
35	85	219	41	+31
35	90	208	44	+26
35	95	199	46	-20
35	100	187	48	+14
35	105	177	49	+ 7
35	110	165	49	0
35	115	154	49	- 7
35	120	145	48	-14
40	70	243	28	+37
40	75	235	32	+34
40	80	229	34	+31
40	85	218	37	+27
40	90	207	39	+22
40	95	195	41	+17
40	100	185	43	+12
40	105	176	44	+ 6
40	110	163	44	0
40	115	153	44	- 6
40	120	146	43	-11
40	125	137	41	-17
45	70	250	25	+33
45	75	237	28	+30
45	80	227	30	+27
45	85	217	33	+23
45	90	210	35	+17
45	95	194	36	+15
45	100	183	37	+10
45	105	171	38	+ 5
45	110	162	38	0
45	115	154	38	- 5
45	120	146	37	-10
45	125	139	36	-14
50	70	248	21	+28
50	75	240	24	+26
50	80	229	26	+23
50	85	215	28	+20
50	90	203	30	+16
50	95	193	31	+12
50	100	181	32	+ 8
50	105	168	33	+ 4
50	110	161	33	0
50	115	154	33	- 4
50	120	146	32	- 8
50	125	140	31	-12

Legend - LAT = Latitude Degrees North
LONG = Longitude Degrees West
AZ = Azimuth Heading, Direct Compass Reading (Magnetic Deviation is Included in Charts)
EL = Elevation in Degrees, Direct Reading
POL = Polarization of Feed Scale Setting in degrees for Vertical Polarity. If Horizontal Polarity is desired, rotate Feed 90° (clockwise or counterclockwise) from values shown on charts above.

TS GE1

US ANTENNA ALIGNMENT CHARTS

C3 (ANIK) SATELLITE 117.5° W

LAT.	LONG.	AZ	EL	POL.
25	80	241	39	+53
25	85	234	44	+49
25	90	226	48	+45
25	95	216	52	+39
25	100	206	55	+33
30	80	237	36	+47
30	85	230	40	+43
30	90	221	44	+39
30	95	212	47	+34
30	100	202	50	+28
30	105	193	52	+21
30	110	182	54	+13
30	115	170	55	+ 5
35	75	244	30	+44
35	80	237	33	+41
35	85	228	37	+38
35	90	218	40	+33
35	95	210	43	+29
35	100	199	45	+23
35	105	189	47	+17
35	110	178	49	+11
35	115	167	49	+ 4
35	120	158	49	+ 3
40	70	250	23	+41
40	75	243	27	+39
40	80	236	30	+36
40	85	227	33	+33
40	90	216	36	+29
40	95	205	38	+25
40	100	196	40	+20
40	105	187	42	+15
40	110	175	43	+ 9
40	115	165	44	+ 3
40	120	157	44	- 3
40	125	148	43	- 8
45	70	257	20	+36
45	75	244	24	+34
45	80	235	26	+31
45	85	226	29	+28
45	90	213	31	+25
45	95	203	34	+21
45	100	193	35	+17
45	105	181	37	+12
45	110	173	38	+ 8
45	115	165	38	+ 3
45	120	157	38	- 2
45	125	150	38	- 7
50	70	255	18	+32
50	75	248	20	+30
50	80	237	23	+27
50	85	224	25	+24
50	90	212	27	+21
50	95	202	29	+18
50	100	190	30	+14
50	105	178	32	+11
50	110	171	32	+ 7
50	115	163	33	+ 2
50	120	156	33	- 2
50	125	149	32	- 6

ASC-1 SATELLITE 128°

LAT.	LONG.	AZ	EL	POL.
25	80	249	30	+57
25	85	244	34	+54
25	90	237	38	+51
25	95	229	43	+48
25	100	222	47	+43
30	80	246	28	+51
30	85	240	32	+48
30	90	232	36	+45
30	95	224	40	+41
30	100	217	44	+37
30	105	209	47	+31
30	110	200	50	+25
30	115	190	52	+18
35	75	253	22	+48
35	80	247	25	+46
35	85	238	29	+43
35	90	230	33	+40
35	95	223	36	+36
35	100	213	40	+32
35	105	205	43	+27
35	110	195	45	+21
35	115	185	47	+15
35	120	176	49	+ 8
40	70	258	16	+45
40	75	252	19	+43
40	80	246	23	+40
40	85	237	26	+38
40	90	228	30	+35
40	95	217	33	+31
40	100	210	36	+27
40	105	201	38	+23
40	110	190	40	+18
40	115	181	42	+13
40	120	173	43	+ 7
40	125	165	44	+ 1
45	70	266	14	+40
45	75	254	17	+38
45	80	246	20	+36
45	85	237	23	+33
45	90	225	26	+30
45	95	216	29	+27
45	100	207	32	+24
45	105	195	33	+20
45	110	187	35	+15
45	115	179	37	+11
45	120	171	38	+ 6
45	125	164	38	+ 1
50	70	264	11	+35
50	75	258	14	+33
50	80	247	17	+31
50	85	235	20	+29
50	90	224	22	+26
50	95	214	25	+23
50	100	203	27	+20
50	105	191	29	+17
50	110	184	30	+13
50	115	177	31	+ 9
50	120	169	32	+ 5
50	125	163	33	+ 1

Legend - LAT = Latitude Degrees North
LONG = Longitude Degrees West
AZ = Azimuth Heading, Direct Compass Reading (Magnetic Deviation is Included in Charts)
EL = Elevation in Degrees, Direct Reading
POL = Polarization of Feed Scale Setting in degrees for Vertical Polarity. If Horizontal Polarity is desired, rotate Feed 90° (clockwise or counterclockwise) from values shown on charts above.

EUROPEAN ANTENNA ALIGNMENT CHARTS

EUTELSAT F1 SAT. 13.0° E

LAT.	LONG.	AZ	EL	LAT.	LONG.	AZ	EL
25.0	10W	135	51	45.0	10W	149	33
	5W	142	55		5W	155	35
	0	151	57		0	162	37
	5E	162	59		5E	169	38
	10E	173	61		10E	176	38
	15E	185	61		15E	183	38
	20E	196	60		20E	190	38
	25E	207	58		25E	197	37
27.5	10W	137	49	47.5	10W	150	31
	5W	145	52		5W	156	33
	0	153	55		0	163	34
	5E	163	57		5E	169	35
	10E	174	58		10E	176	35
	15E	184	58		15E	183	35
	20E	195	57		20E	190	35
	25E	205	55		25E	196	34
30.0	10W	140	47	50.0	10W	151	29
	5W	147	50		5W	157	30
	0	155	52		0	163	31
	5E	163	54		5E	170	32
	10E	174	55		10E	176	33
	15E	184	55		15E	183	33
	20E	194	54		20E	189	32
	25E	203	53		25E	196	32
32.5	10W	142	45	52.5	10W	152	26
	5W	149	48		5W	158	28
	0	157	50		0	164	29
	5E	165	51		5E	170	30
	10E	174	52		10E	176	30
	15E	184	52		15E	183	30
	20E	193	51		20E	189	30
	25E	202	50		25E	195	29
35.0	10W	144	43	55.0	10W	153	24
	5W	151	45		5W	158	25
	0	158	47		0	164	26
	5E	166	49		5E	170	27
	10E	175	49		10E	176	27
	15E	184	49		15E	182	27
	20E	192	49		20E	189	27
	25E	200	47		25E	195	26
37.5	10W	145	40	57.5	10W	153	22
	5W	152	43		5W	159	23
	0	159	44		0	165	24
	5E	167	46		5E	171	24
	10E	175	46		10E	176	25
	15E	183	47		15E	182	25
	20E	191	46		20E	188	24
	25E	199	45		25E	194	24
40.0	10W	147	38	60.0	10W	154	19
	5W	153	40		5W	159	20
	0	160	42		0	165	21
	5E	168	43		5E	171	22
	10E	175	44		10E	177	22
	15E	183	44		15E	182	22
	20E	191	43		20E	188	22
	25E	198	42		25E	194	21
42.5	10W	148	36	62.5	10W	154	17
	5W	154	38		5W	160	18
	0	161	39		0	164	19
	5E	168	40		5E	171	19
	10E	176	41		10E	177	19
	15E	183	41		15E	182	19
	20E	190	40		20E	188	19
	25E	198	40		25E	194	19

ASTRA SATELLITE 19.2° E

LAT.	LONG.	AZ	EL	LAT.	LONG.	AZ	EL
25.0	10W	127	46	45.0	10W	142	31
	5W	133	50		5W	148	33
	0	141	54		0	154	35
	5E	149	57		5E	160	36
	10E	159	59		10E	167	37
	15E	170	60		15E	174	38
	20E	182	61		20E	181	38
	25E	194	60		25E	188	38
27.5	10W	130	45	47.5	10W	143	29
	5W	136	48		5W	149	31
	0	143	52		0	155	32
	5E	151	54		5E	161	34
	10E	161	56		10E	168	35
	15E	171	58		15E	174	35
	20E	182	58		20E	181	35
	25E	192	57		25E	189	35
30.0	10W	132	43	50.0	10W	144	26
	5W	138	46		5W	150	28
	0	145	49		0	157	30
	5E	153	52		5E	162	31
	10E	161	54		10E	168	32
	15E	171	55		15E	175	33
	20E	182	55		20E	181	33
	25E	192	55		25E	188	32
32.5	10W	134	41	52.5	10W	145	24
	5W	140	44		5W	151	26
	0	147	47		0	156	27
	5E	155	49		5E	162	29
	10E	163	51		10E	169	29
	15E	172	52		15E	175	30
	20E	182	52		20E	181	30
	25E	191	52		25E	187	30
35.0	10W	136	39	55.0	10W	146	22
	5W	142	42		5W	153	24
	0	149	45		0	157	25
	5E	156	47		5E	163	26
	10E	164	48		10E	169	27
	15E	173	49		15E	175	27
	20E	181	49		20E	181	27
	25E	190	49		25E	187	27
37.5	10W	137	37	57.5	10W	147	20
	5W	144	40		5W	152	21
	0	150	42		0	158	23
	5E	157	44		5E	163	23
	10E	165	46		10E	169	24
	15E	173	46		15E	175	25
	20E	181	47		20E	181	25
	25E	190	46		25E	187	24
40.0	10W	139	35	60.0	10W	147	18
	5W	145	37		5W	153	19
	0	152	40		0	158	20
	5E	159	42		5E	164	21
	10E	166	43		10E	169	22
	15E	174	44		15E	175	22
	20E	181	44		20E	181	22
	25E	189	43		25E	188	22
42.5	10W	140	33	62.5	10W	148	15
	5W	146	35		5W	153	17
	0	153	37		0	159	18
	5E	160	39		5E	164	18
	10E	167	40		10E	170	19
	15E	174	41		15E	175	19
	20E	181	41		20E	181	19
	25E	189	41		25E	187	19

LEGEND: **LAT.** = **Latitude Degrees North**
LONG. = **Longitude Degrees, East or West, as indicated**
AZ. = **Azimuth Heading, Direct Compass Reading**
EL. = **Elevation in Degrees, Direct Reading**

EUROPEAN ANTENNA ALIGNMENT CHARTS

DFS KOPERNIKUS SAT. 23.5° E

LAT.	LONG.	AZ	EL	LAT.	LONG.	AZ	EL
25.0	10W	123	43	45.0	10W	137	29
	5W	128	47		5W	143	31
	0	134	51		0	148	33
	5E	142	54		5E	155	35
	10E	150	57		10E	162	37
	15E	161	59		15E	168	38
	20E	172	61		20E	175	38
	25E	184	61		25E	182	38
27.5	10W	125	41	47.5	10W	138	27
	5W	130	45		5W	144	29
	0	137	49		0	150	31
	5E	144	52		5E	156	33
	10E	153	55		10E	162	34
	15E	162	57		15E	169	35
	20E	173	58		20E	175	35
	25E	183	58		25E	175	35
30.0	10W	127	40	50.0	10W	139	25
	5W	133	43		5W	145	27
	0	139	47		0	150	29
	5E	146	50		5E	156	30
	10E	154	52		10E	163	31
	15E	163	54		15E	169	32
	20E	173	55		20E	175	33
	25E	183	55		25E	182	33
32.5	10W	129	38	52.5	10W	140	23
	5W	135	41		5W	146	24
	0	141	45		0	151	26
	5E	148	47		5E	157	28
	10E	156	50		10E	163	29
	15E	165	51		15E	169	30
	20E	174	52		20E	176	30
	25E	174	52		25E	182	30
35.0	10W	131	36	55.0	10W	141	20
	5W	137	39		5W	147	22
	0	143	42		0	152	24
	5E	150	45		5E	158	25
	10E	157	47		10E	164	26
	15E	165	48		15E	170	27
	20E	174	49		20E	176	27
	25E	183	49		25E	182	27
37.5	10W	133	34	57.5	10W	142	18
	5W	138	37		5W	147	20
	0	145	40		0	153	21
	5E	151	42		5E	158	23
	10E	159	44		10E	164	24
	15E	166	46		15E	170	24
	20E	174	46		20E	176	25
	25E	183	47		25E	181	25
40.0	10W	134	32	60.0	10W	143	16
	5W	140	35		5W	148	18
	0	146	38		0	153	19
	5E	153	40		5E	159	20
	10E	160	42		10E	165	21
	15E	167	43		15E	170	22
	20E	175	44		20E	176	22
	25E	182	44		25E	182	22
42.5	10W	136	31	62.5	10W	143	14
	5W	141	33		5W	149	16
	0	147	36		0	154	17
	5E	154	38		5E	159	18
	10E	160	39		10E	165	18
	15E	168	40		15E	170	19
	20E	175	41		20E	176	19
	25E	182	41		25E	182	19

INTELSAT F12 SAT. 60.0° E

LAT.	LONG.	AZ	EL	LAT.	LONG.	AZ	EL
25.0	10W	99	10	45.0	10W	104	5
	5W	101	14		5W	108	9
	0	104	19		0	112	12
	5E	107	23		5E	116	16
	10E	110	28		10E	121	19
	15E	113	33		15E	125	22
	20E	117	37		20E	130	25
	25E	121	41		25E	135	28
27.5	10W	100	9	47.5	10W	105	5
	5W	102	14		5W	109	8
	0	105	18		0	113	11
	5E	108	23		5E	117	14
	10E	111	27		10E	122	18
	15E	115	31		15E	126	20
	20E	119	36		20E	131	23
	25E	123	40		25E	137	26
30.0	10W	100	9	50.0	10W	106	4
	5W	103	13		5W	110	7
	0	106	17		0	114	10
	5E	109	22		5E	118	13
	10E	113	26		10E	123	16
	15E	117	30		15E	128	18
	20E	121	34		20E	132	21
	25E	126	38		25E	138	24
32.5	10W	101	8	52.5	10W	106	3
	5W	104	12		5W	110	6
	0	107	17		0	115	9
	5E	111	21		5E	119	12
	10E	114	25		10E	124	15
	15E	118	29		15E	128	17
	20E	123	33		20E	133	20
	25E	128	37		25E	139	22
35.0	10W	102	8	55.0	10W	107	3
	5W	105	12		5W	111	5
	0	108	16		0	115	8
	5E	112	20		5E	120	11
	10E	116	24		10E	125	13
	15E	120	28		15E	129	16
	20E	124	32		20E	134	18
	25E	129	35		25E	140	20
37.5	10W	103	7	57.5	10W	107	2
	5W	106	11		5W	112	5
	0	109	15		0	116	7
	5E	113	19		5E	121	10
	10E	117	23		10E	125	12
	15E	121	26		15E	130	14
	20E	126	30		20E	135	16
	25E	131	33		25E	140	18
40.0	10W	103	7	60.0	10W	108	1
	5W	107	10		5W	112	4
	0	110	14		0	117	6
	5E	114	18		5E	121	8
	10E	118	21		10E	126	10
	15E	123	25		15E	131	12
	20E	128	28		20E	136	14
	25E	133	32		25E	141	16
42.5	10W	104	6	62.5	10W	108	1
	5W	108	10		5W	113	3
	0	111	13		0	117	5
	5E	115	17		5E	122	7
	10E	120	20		10E	127	9
	15E	124	24		15E	132	11
	20E	129	27		20E	137	12
	25E	134	30		25E	142	14

LEGEND: **LAT.** = **Latitude Degrees North**
LONG. = **Longitude Degrees, East or West, as indicated**
AZ. = **Azimuth Heading, Direct Compass Reading**
EL. = **Elevation in Degrees, Direct Reading**

EUROPEAN ANTENNA ALIGNMENT CHARTS

TELCOM SATELLITE 5.0°W

LAT.	LONG.	AZ	EL	LAT.	LONG.	AZ	EL
25.0	10W	168	60	45.0	10W	173	38
	5W	180	61		5W	180	38
	0	192	60		0	187	38
	5E	203	59		5E	194	37
	10E	212	56		10E	201	36
	15E	221	53		15E	207	35
	20E	228	50		20E	213	33
	25E	234	46		25E	219	30
27.5	10W	169	57	47.5	10W	173	35
	5W	180	58		5W	180	35
	0	191	57		0	187	35
	5E	201	56		5E	194	35
	10E	210	54		10E	200	34
	15E	218	51		15E	206	32
	20E	225	48		20E	212	30
	25E	231	44		25E	218	28
30.0	10W	170	55	50.0	10W	174	33
	5W	180	55		5W	180	33
	0	190	55		0	187	33
	5E	199	53		5E	193	32
	10E	208	51		10E	199	31
	15E	216	49		15E	205	30
	20E	223	46		20E	211	28
	25E	229	42		25E	217	26
32.5	10W	171	52	52.5	10W	174	30
	5W	180	52		5W	180	30
	0	189	52		0	186	30
	5E	198	51		5E	193	29
	10E	207	49		10E	199	28
	15E	214	47		15E	205	27
	20E	221	44		20E	210	26
	25E	227	40		25E	216	24
35.0	10W	171	49	55.0	10W	174	27
	5W	180	49		5W	180	27
	0	189	49		0	186	27
	5E	197	48		5E	192	27
	10E	205	46		10E	198	26
	15E	212	44		15E	204	25
	20E	219	41		20E	210	23
	25E	225	38		25E	215	22
37.5	10W	172	46	57.5	10W	174	25
	5W	180	47		5W	180	25
	0	188	46		0	186	25
	5E	196	45		5E	192	24
	10E	204	44		10E	198	23
	15E	211	42		15E	203	22
	20E	218	39		20E	209	21
	25E	224	36		25E	214	20
40.0	10W	172	44	60.0	10W	174	22
	5W	180	44		5W	180	22
	0	188	44		0	186	22
	5E	195	43		5E	192	21
	10E	203	41		10E	197	21
	15E	210	39		15E	203	20
	20E	216	37		20E	208	19
	25E	222	34		25E	214	17
42.5	10W	173	41	62.5	10W	174	19
	5W	180	41		5W	180	19
	0	187	41		0	186	19
	5E	195	40		5E	191	19
	10E	202	39		10E	197	18
	15E	208	37		15E	202	17
	20E	215	35		20E	208	16
	25E	221	32		25E	213	15

INTELSAT F11 SAT. 27.5°W

LAT.	LONG.	AZ	EL	LAT.	LONG.	AZ	EL
25.0	10W	217	55	45.0	10W	204	35
	5W	224	52		5W	210	34
	0	231	48		0	216	31
	5E	236	44		5E	222	29
	10E	241	39		10E	227	26
	15E	245	35		15E	232	24
	20E	249	30		20E	237	20
	25E	252	26		25E	242	17
27.5	10W	214	53	47.5	10W	203	33
	5W	222	49		5W	209	31
	0	228	46		0	215	29
	5E	234	42		5E	221	27
	10E	239	38		10E	226	25
	15E	243	34		15E	231	22
	20E	247	29		20E	236	19
	25E	251	25		25E	241	16
30.0	10W	212	50	50.0	10W	202	30
	5W	220	47		5W	208	29
	0	226	44		0	214	27
	5E	232	40		5E	220	25
	10E	237	37		10E	225	23
	15E	241	32		15E	230	20
	20E	245	28		20E	235	18
	25E	249	24		25E	240	15
32.5	10W	210	48	52.5	10W	202	28
	5W	218	45		5W	208	27
	0	224	42		0	213	25
	5E	230	39		5E	219	23
	10E	235	35		10E	224	21
	15E	240	31		15E	229	18
	20E	244	27		20E	234	16
	25E	248	23		25E	239	13
35.0	10W	209	45	55.0	10W	201	25
	5W	216	43		5W	207	24
	0	222	40		0	212	23
	5E	228	37		5E	218	21
	10E	233	33		10E	223	19
	15E	238	30		15E	228	17
	20E	242	26		20E	233	14
	25E	246	22		25E	238	12
37.5	10W	207	43	57.5	10W	201	23
	5W	214	41		5W	206	22
	0	221	38		0	212	20
	5E	226	35		5E	217	19
	10E	232	32		10E	222	17
	15E	236	28		15E	227	15
	20E	241	25		20E	232	13
	25E	245	21		25E	237	11
40.0	10W	206	40	60.0	10W	200	20
	5W	213	38		5W	206	19
	0	219	36		0	211	18
	5E	225	33		5E	216	17
	10E	230	30		10E	222	15
	15E	235	27		15E	227	13
	20E	240	23		20E	232	11
	25E	244	20		25E	236	9
42.5	10W	205	38	62.5	10W	200	18
	5W	212	36		5W	205	17
	0	218	34		0	210	16
	5E	223	31		5E	216	15
	10E	229	28		10E	221	13
	15E	234	25		15E	226	11
	20E	238	22		20E	231	10
	25E	243	18		25E	236	8

LEGEND: **LAT.** = Latitude Degrees North
LONG. = Longitude Degrees, East or West, as indicated
AZ. = Azimuth Heading, Direct Compass Reading
EL. = Elevation in Degrees, Direct Reading

EUROPEAN ANTENNA ALIGNMENT CHARTS

BSB SATELLITE 31.0° W

LAT.	LONG.	AZ	EL	LAT.	LONG.	AZ	EL
25.0	10W	222	53	45.0	10W	209	34
	5W	229	49		5W	215	32
	0	235	45		0	220	30
	5E	240	41		5E	226	27
	10E	244	36		10E	231	24
	15E	248	32		15E	236	21
	20E	251	27		20E	240	18
	25E	254	22		25E	245	15
27.5	10W	220	50	47.5	10W	208	32
	5W	227	47		5W	214	30
	0	233	43		0	219	28
	5E	238	39		5E	225	25
	10E	242	35		10E	230	23
	15E	246	31		15E	235	20
	20E	250	26		20E	239	17
	25E	253	22		25E	244	14
30.0	10W	218	48	50.0	10W	207	29
	5W	224	45		5W	213	28
	0	230	41		0	218	26
	5E	236	38		5E	224	23
	10E	240	34		10E	229	21
	15E	244	29		15E	234	18
	20E	248	25		20E	238	16
	25E	251	21		25E	243	13
32.5	10W	216	46	52.5	10W	206	27
	5W	222	43		5W	212	25
	0	228	40		0	217	24
	5E	234	36		5E	223	21
	10E	238	32		10E	228	19
	15E	243	28		15E	233	17
	20E	247	24		20E	237	14
	25E	250	20		25E	242	11
35.0	10W	214	44	55.0	10W	205	25
	5W	220	41		5W	211	23
	0	226	38		0	216	21
	5E	232	34		5E	222	20
	10E	237	31		10E	228	17
	15E	241	27		15E	232	15
	20E	245	23		20E	236	13
	25E	249	19		25E	241	10
37.5	10W	212	41	57.5	10W	205	22
	5W	219	39		5W	210	21
	0	225	36		0	216	19
	5E	230	33		5E	221	18
	10E	235	29		10E	226	16
	15E	240	26		15E	231	14
	20E	244	22		20E	236	11
	25E	248	18		25E	240	9
40.0	10W	211	39	60.0	10W	204	20
	5W	217	37		5W	209	19
	0	223	34		0	215	17
	5E	229	31		5E	220	16
	10E	234	28		10E	225	14
	15E	238	24		15E	230	12
	20E	243	21		20E	235	10
	25E	247	17		25E	240	8
42.5	10W	210	37	62.5	10W	203	17
	5W	216	34		5W	209	16
	0	222	32		0	214	15
	5E	227	29		5E	219	14
	10E	232	26		10E	224	12
	15E	237	23		15E	229	10
	20E	241	20		20E	234	8
	25E	246	16		25E	239	6

LEGEND: **LAT.** = Latitude Degrees North
LONG. = Longitude Degrees, East or West, as indicated
AZ. = Azimuth Heading, Direct Compass Reading
EL. = Elevation in Degrees, Direct Reading

PARTS AND HARDWARE LISTING

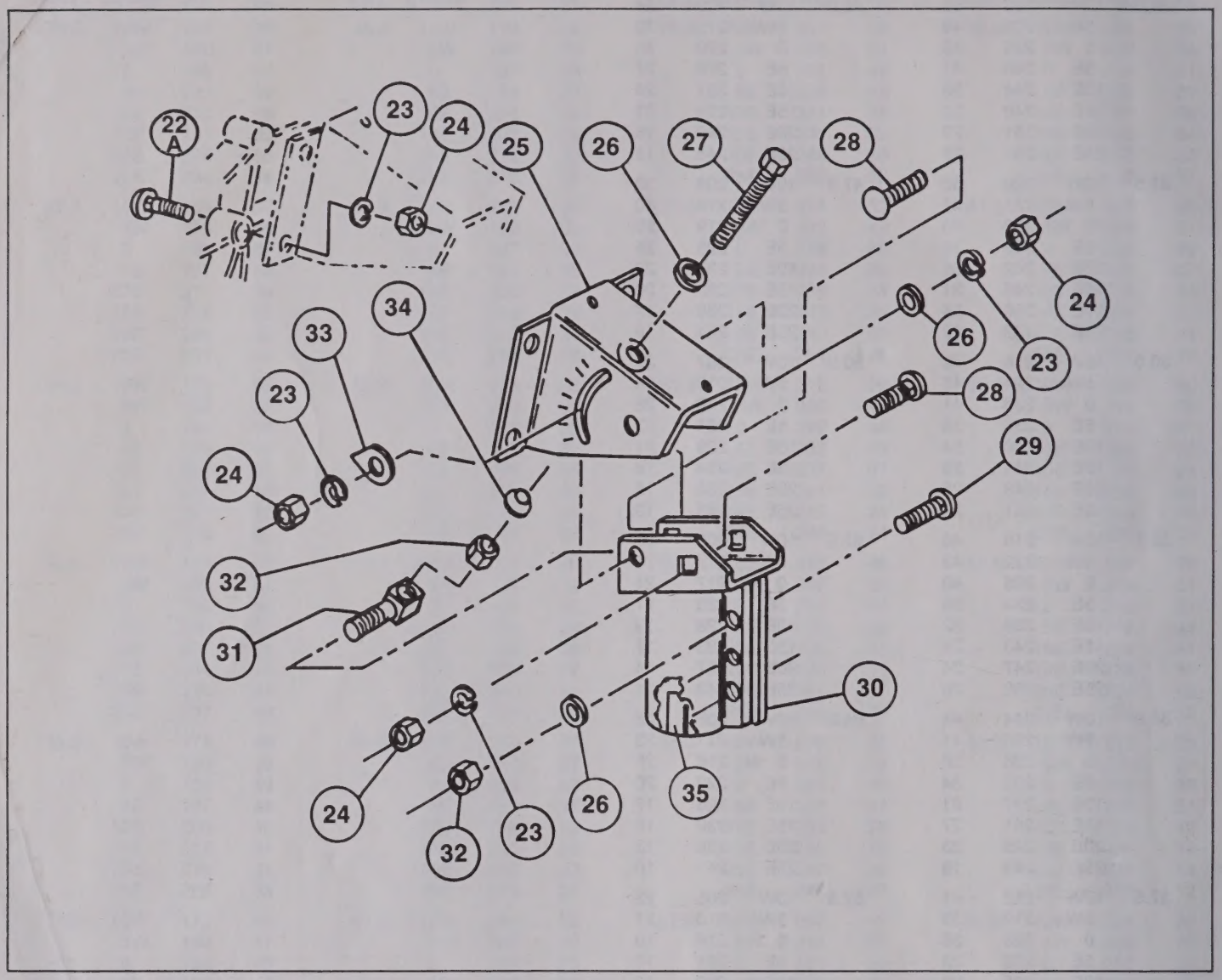


FIG. 4.0—AZ/EL CAP MOUNT

NO.		QTY.	NO.		QTY.	NO.		QTY.	NO.		QTY.
22 A	Bolt—Round Head, Square Neck M8x60 PN 2070022-01	4	26	Washer Flat M8 (5/16) PN 2503300 Mo. 6030 Mo. 6031	4 5	30	Clamp-Weldment PN 2020322-02 Mo. 6031	1	35	Pad - Abrasive PN 1010047	1
23	Washer-Lock M8 (5/16) PN 2603300	4	27	Bolt-Hex M8x130 PN 2060006-01	1	31	Nut-Swivel/Special PN 2380067-02	1	—	Mount Assy. Mo. 6030 PN 6010046	—
24	Nut-Hex M8 PN 2460800	4	28	Bolt-Round Head, Square Neck M8x20 PN 2070022-03	3	32	Nut-Elastic Stop M8 PN 2380075 Mo. 6030 Mo. 6031	3 4	—	Mount Assy. Mo. 6031 PN 6010017	—
25	Housing AZ/EL PN 2010115 Mo. 6030	1	29	Bolt-Round Head, Square Neck M8 x 35 Mo. 6030 PN 2070022-05 Mo. 6031	2 3	33	Pointer PN 2010119	1			
25	Housing AZ/EL PN 2010105 Mo. 6031	1	30	Clamp-Weldment PN 2020343-02 Mo. 6030	1	34	Washer-Spherical PN 2509002	1			

*Included with Antenna

PARTS AND HARDWARE LISTING

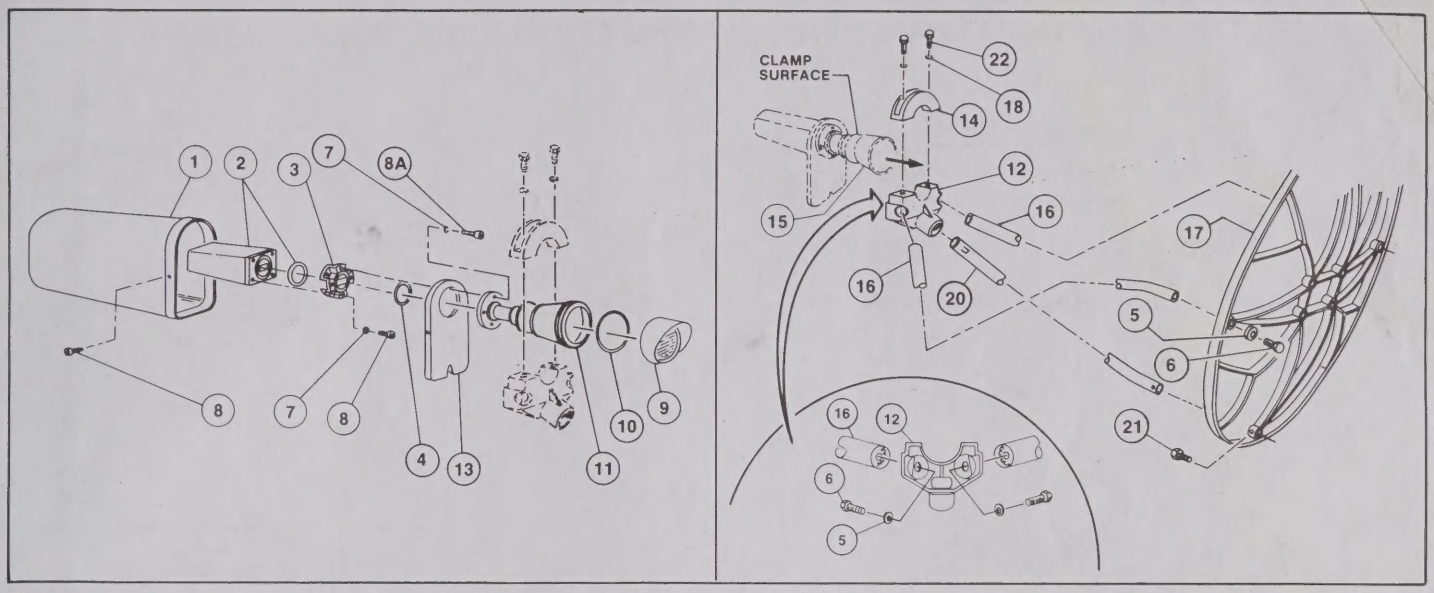


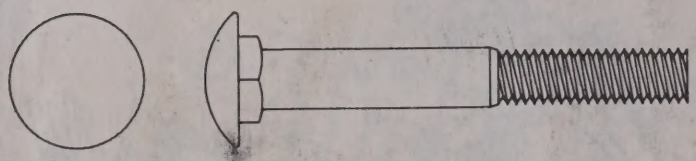
FIG. 4.1 - ANTENNA, ANTENNA FEED (LNB) & FEED SUPPORT LEGS

NO.		QTY.	NO.		QTY.	NO.		QTY.	NO.		QTY.
1	COVER-WEATHER PN 2230134	1	8	SCREW-PHILLIPS HD PN 2430070-01 M4x10	6	14	CLAMP-HALF-JCT. PN 3040663	1	20	LEG-BOTTOM-FEED PN 2020329-02 (1.0m)	1
2	LNB W/"O" RING 1.6dB PN 3030027	1	8A	SCREW PHH M4x12mm PN 2430070-04	8	15	KU-FEED ASSY. PN 6010053**	1	20	LEG-BOTTOM-FEED PN 2020329-03 (1.2m)	1
3	TRANSITION PN 3040655	1	9	HOOD PN 3040650	1	16	LEG-SIDE-FEED (1.0m) PN 6010100-05	2	21	SCREW-TPG-SPL M6 PN 2060009	1
4	"O"-RING TRANSITION PN 1320017-01 .86 I.D.	1	10	"O"-RING HORN PN 1320015-01 1.98 I.D.	1	16	LEG-SIDE-FEED (1.2m) PN 6010100-06	2	22	BOLT HH M6x20 PN 2050610-20	2
5	WASHER-FLAT PN 2502700 ¼x¾" O.D.	4	11	HORN PN 3040645	1	17	ANTENNA-SMC-1.0m PN 3040642-02	1	16	LEG-SIDE—FEED PN 6010100-07 (.90m)	2
6	BOLT-HEX M6x30 PN 2060008	4	12	BLOCK-JUNCTION PN 3040667-04	1	17	ANTENNA-SMC-1.2m PN 3040646	1	17	ANTENNA-SMC .90m PN 3040681-01	1
7	WASHER-LOCK #8 PN 2598000	8	13	HEADER PN 2230136-02	1	18	WASHER-FLAT PN 2480600 M6x½" O.D.	2	20	LEG BOTTOM PN 2020329-07	1

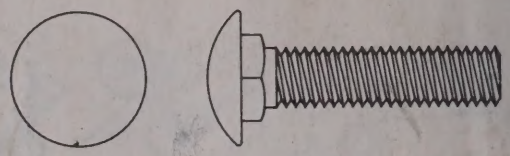
**PN must include Logo and LNB dB rating.

HARDWARE SORTER

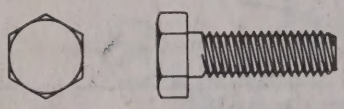
NOTE: 10mm tools fit M6 hardware and 13mm tools fit M8 hardware.



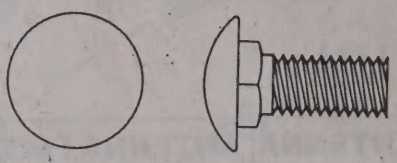
M8 x 60mm Round Head Square Neck Bolt
Item 22A, PN 2070022-01



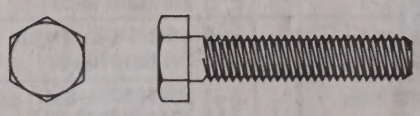
M8 x 35mm Round Head Square Neck Bolt
Item 29, PN 2070022-05



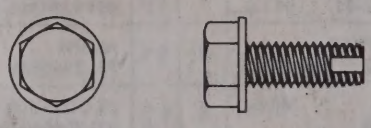
M6 x 20mm Hex Head Bolt
Item 22, PN 2050610-20



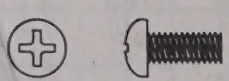
M8 x 20mm Round Head Square Neck Bolt
Item 28, PN 2070022-03



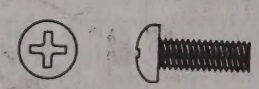
M6 x 30mm Hex Head Bolt
Item 6, PN 2060008



M6 Tapping Screw
Item 21, PN 2060009



M4 x 10mm Phillips Head Screw
Item 8, PN 2430070-01



M4 x 12mm Phillips Head Screw
Item 8A, PN 2430070-04

Hardware illustrations are true size.
Place actual hardware on top of illustration to identify.